



DCATT PROJECT Review AO Bench Components and Alignment plan

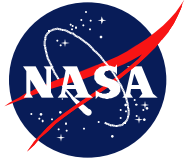
Summary of status of DCATT components

OPTIC	Description	Physical	Optical	Status
Beamsplitter	ZYGO corporation	BK-7, 1.5 inches diameter, .25 in thick Wedge 15 arcminutes	Transmitted wavefront distortion /20 scratch dig 60/40	Expected delivery August 20
OAP1	Lambda/Ten (McPherson) First off-axis parabola	8 inches diameter, 9 inch off-axis distance	Measured Figure: less than /20 PV @633 rms Measured surface roughness less than 10 Angstroms	Delivered, Coated, Reflectance > 90%, microroughness measured Mounted
FLAT1	Lambda/Ten (McPherson)	6 inch diameter mirror	Measured Figure: less than /18 PV @633 rms Measured surface roughness less than 10 Angstroms	Delivered, Coated, Reflectance > 90%, microroughness measured Mounted
DM	Xinetics 349 Actuator deformable mirror, 7 mm spacing, 4 micron stroke	clear aperure 147 mm	Figure /14, Scratch dig 60/40, Surface finish < 15	Delivery expected August 24 Software already here.
OAP2	Lambda/Ten (McPherson)	8 inches diameter, 9 inch off-axis distance, ~2 inches thick	Measured Figure: less than /18 PV @633 rms Measured surface roughness less than 10 Angstroms	Delivered, Coated, Reflectance > 90%, microroughness measured Mounted
FSM/FLAT2	Lambda/Ten (McPherson)	6 inch diameter mirror	Measured Figure: less than /25 PV @633 rms Measured surface roughness less than 10 Angstroms	Delivered, Coated, Reflectance > 90%, microroughness measured Mounted
DFS (Grism)	Spectronics Instrument (formally- Richardson grating Lab)	25 x 25 x 4.5 mm	Blazed for 600 nm 35 groves per mm prism apex angle 2.46 deg	Delivered to GSFC needs mounting

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Aft Optics components and Alignment

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Beamsplitter

Substrate Specifications

Diameter	1.5 inches (38 mm)
Thickness	.25 (6.35 mm)
Material	BK-7
Vendor	ygo Corporation
Surface figure	/20 in transmittance and reflectance over diameter of piece
Active Area	24 mm

Coating Strategy

- Multiple substrates purchased
- Initially metal coatings e.g.
Aluminum - In house
- Dielectric coatings
- Antireflection coating

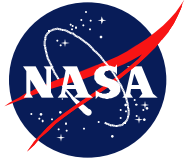
Current Status

Waiting for delivery of substrates

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AO Bench Components and Alignment plan

Off Axis Parabolas

Specifications

Vendor	Lambda Ten Corporation
Diameter	8 inches (200 mm)
Off Axis distance	9 inches (227 mm)
Material	Zerodur
Active Area	164 _{mm}
Focal Length	80 in. (2032 mm)
Surface figure	/18 over diameter of piece

Surface microroughness Measured : < 10 Angstroms

Current Status

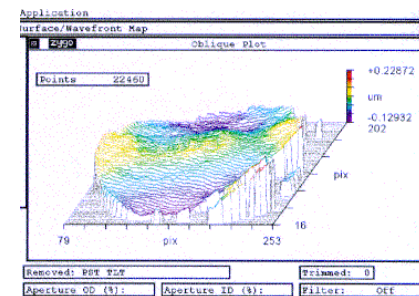
- Alignment cubes
- Phase Interferometry for figure
- Mounts Available
- Mirrors coated at GSFC



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Large flat mirror

Specifications

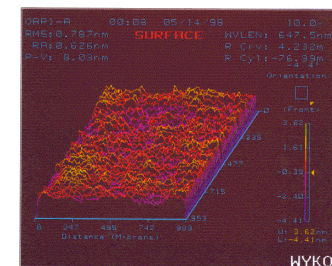
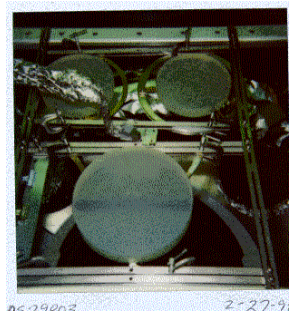
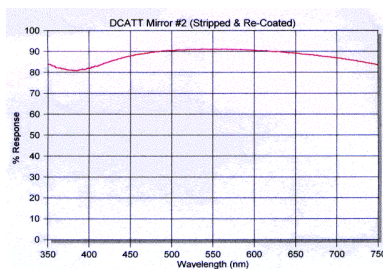
Vendor	Lambda Ten Corporation
Diameter	6 inches (152 mm)
Material	Zerodur
Surface figure	$\lambda/25$ PV in over diameter of piece 0.008 waves rms
Surface micro-roughness	Measured < 10 Angstroms

Status

Spare mirrors to be used
in alignment

Mounts developed for
mirror

Mirrors coated at GSFC



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AO Bench Components and Alignment plan

Deformable Mirror

Specifications

349 Actuators, 7 mm spacing

- Ultra low expansion face sheet
- PMN multilayer actuators, low hysteresis
- 147 clear aperture and reflective diameter
- Mechanical stroke 4 μm
- Surface finish < 15 Angstroms
- Frequency response full stroke at 1 khz
- Present software allows uploads of table file of values to mirror.
- Software is also capable of monitoring of Zener diode protection



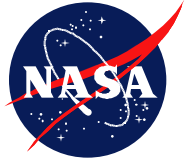
Status

- Manufacturer - Xinetics expect to ship next week
- Already fully tested and is being integrated

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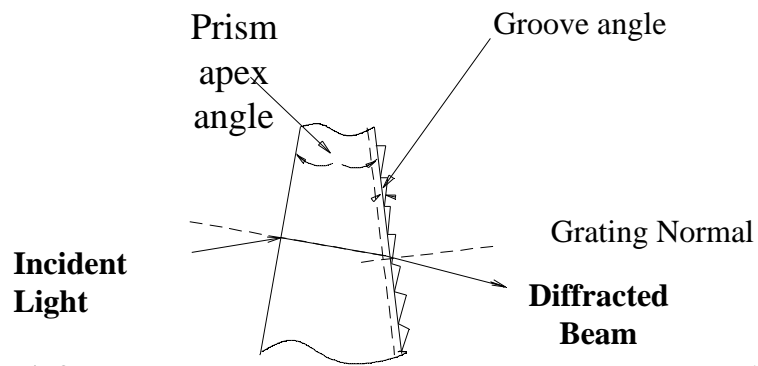
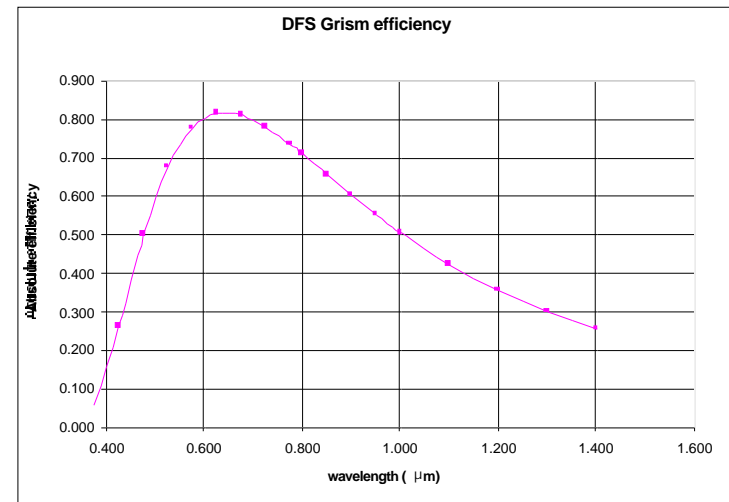
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DFS Grism

Vendor	Spectronics (Richardson)
Size	25 x 25 mm
Active Area	18.5 mm
Material	BK-7
Center thickness	4.5 mm
Prism Angle	2.464 degrees
Blaze angle	2.2 degree
Groove density	35 grooves/mm
Grating Order	1
Wavelength range	475 – 900 nm

Status

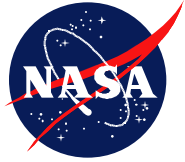
- delivered last week
- mount being developed
- characterization plan being written



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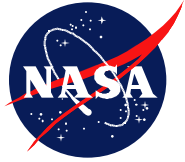
Other components available

- Wavescope Shack- Hartmann Interferometer
 - Relay optics
- CCD Camera
- Spare Optics
- Tungsten Source
- Stabilized laser
- Microscope Objective

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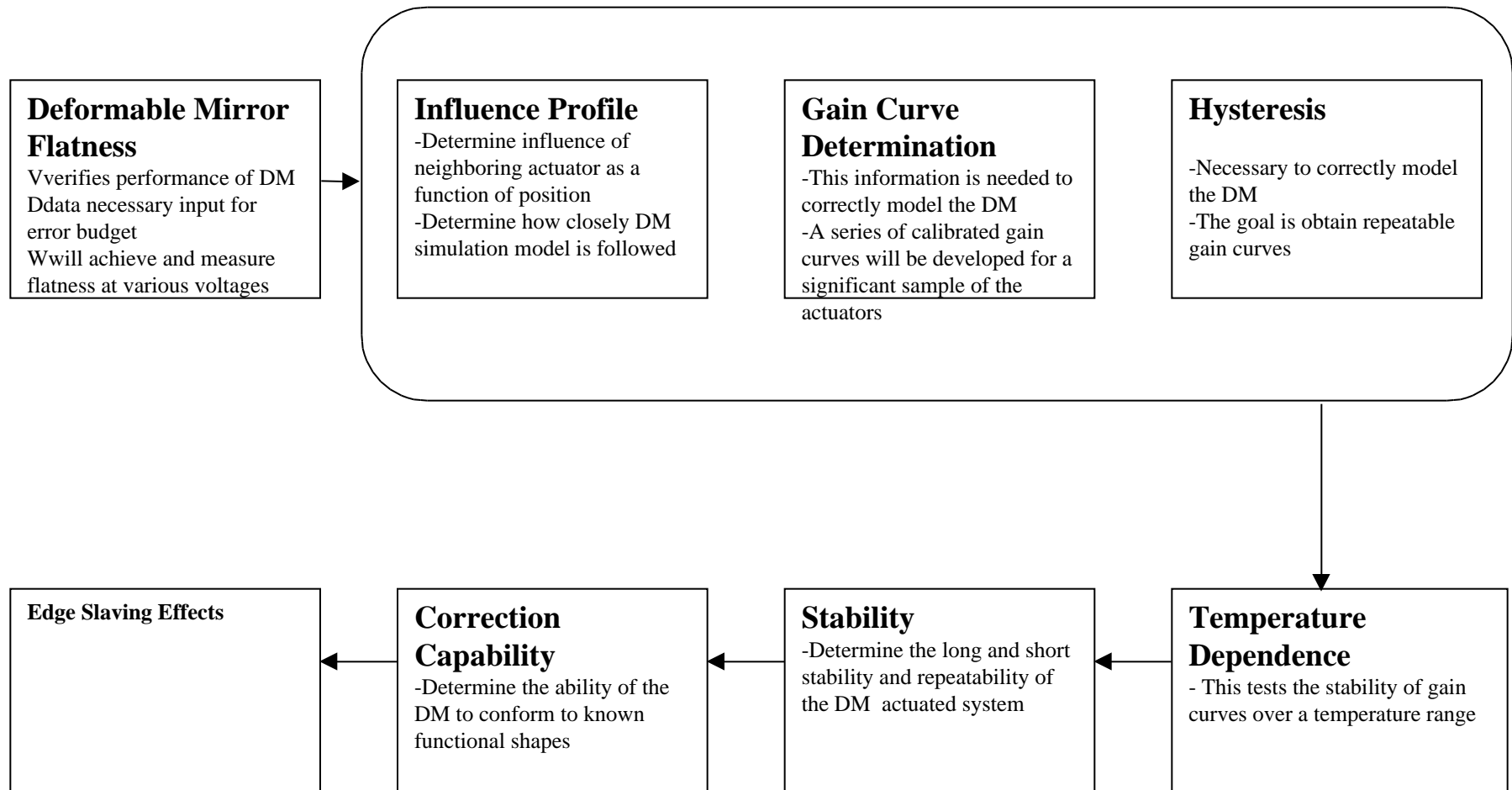
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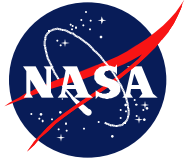
DM testing sequence



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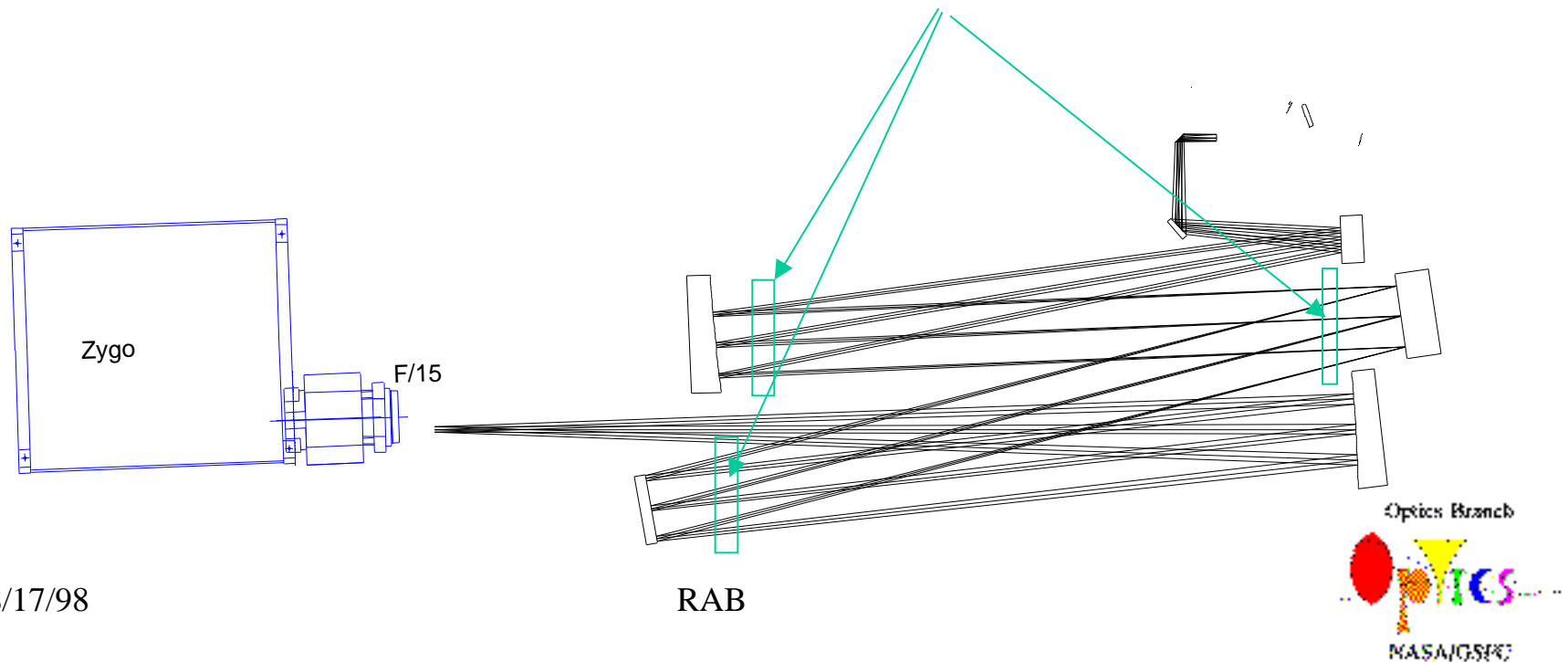




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Alignment method

- Defining location of DCATT master reference
- Elements will be aligned in sequence
- Physically placement of elements in approximate location
- Using alignments cubes and flats for more precise adjustments
- Using Interferometer along with insertion of retro flat for final alignment



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DFS calibration

- Plan is currently under development
- Will probably use AO layout with white light, CCD camera and monochromator

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